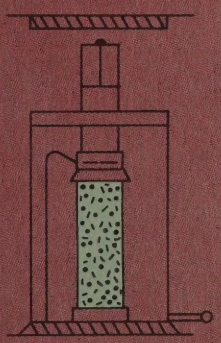
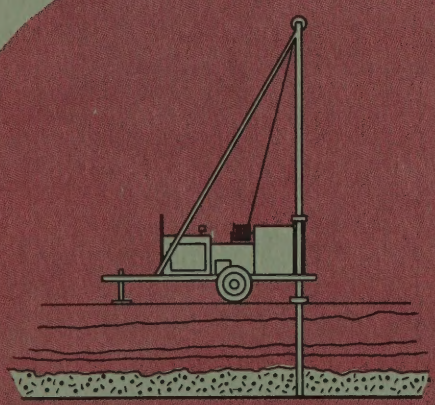
P.H.BIRD

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION

SOIL MECHANICS
BUREAU





REPORT OF TELEVISION BOREHOLE SURVEY OF A WELL AT THE PATTERSONVILLE SERVICE AREA ON THE NEW YORK STATE THRUWAY

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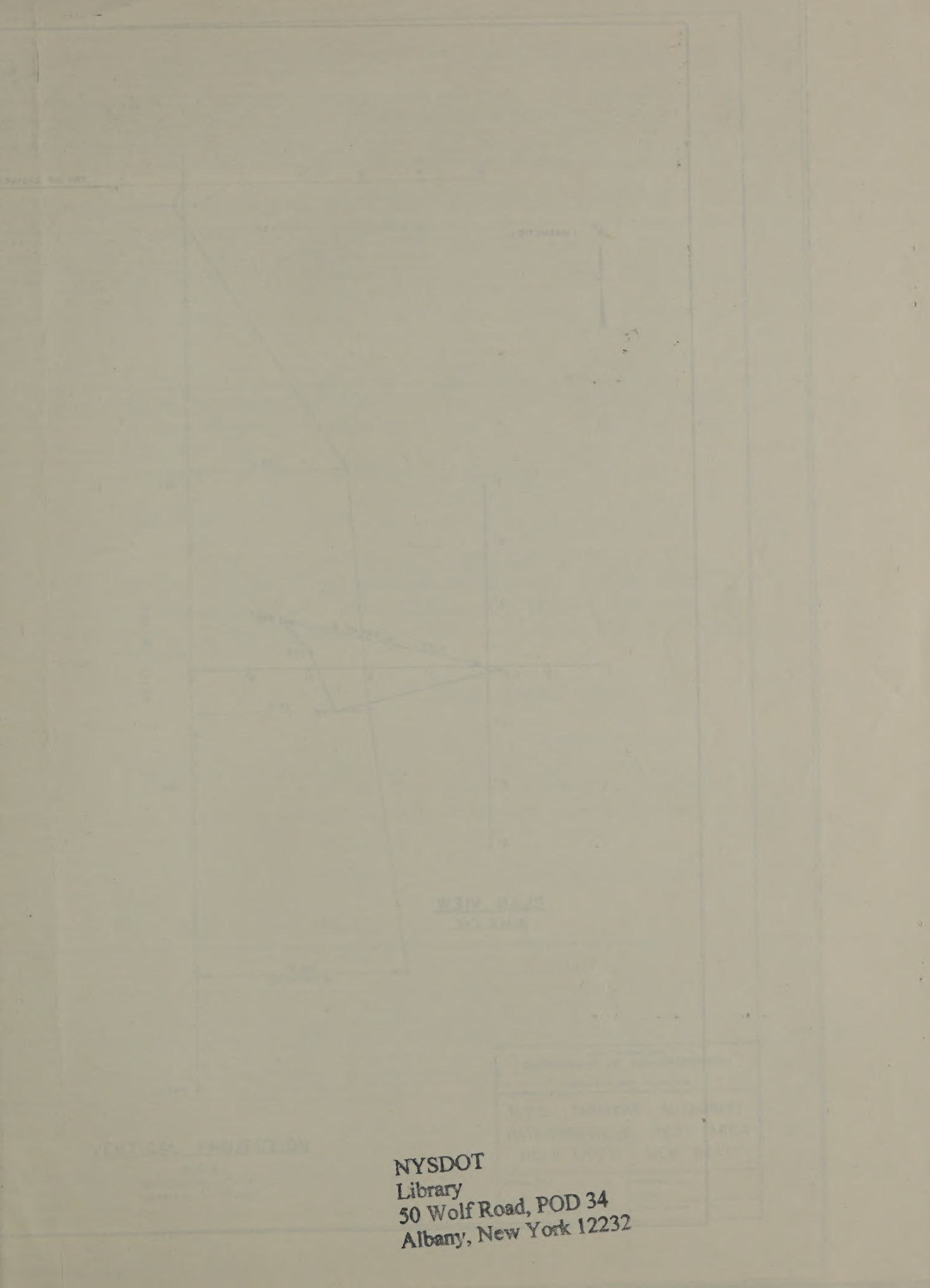

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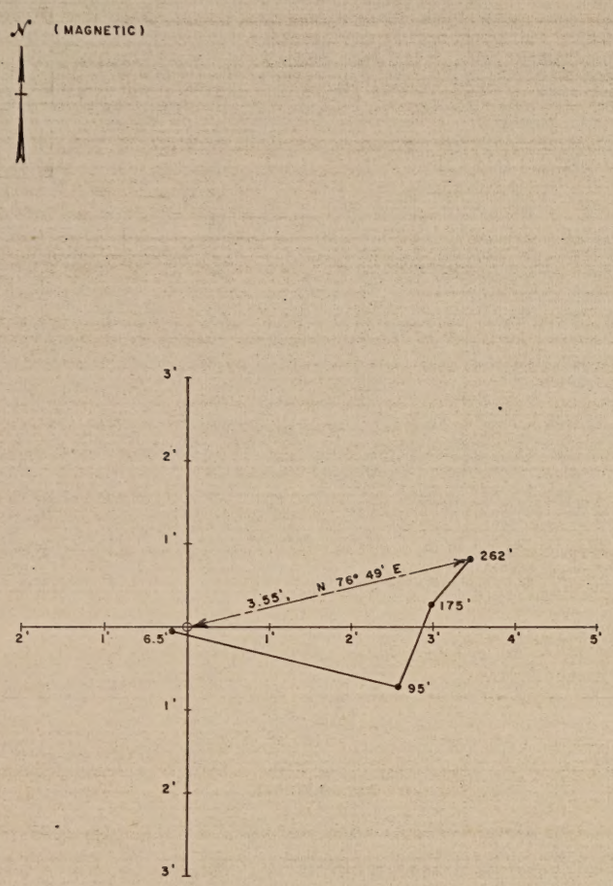
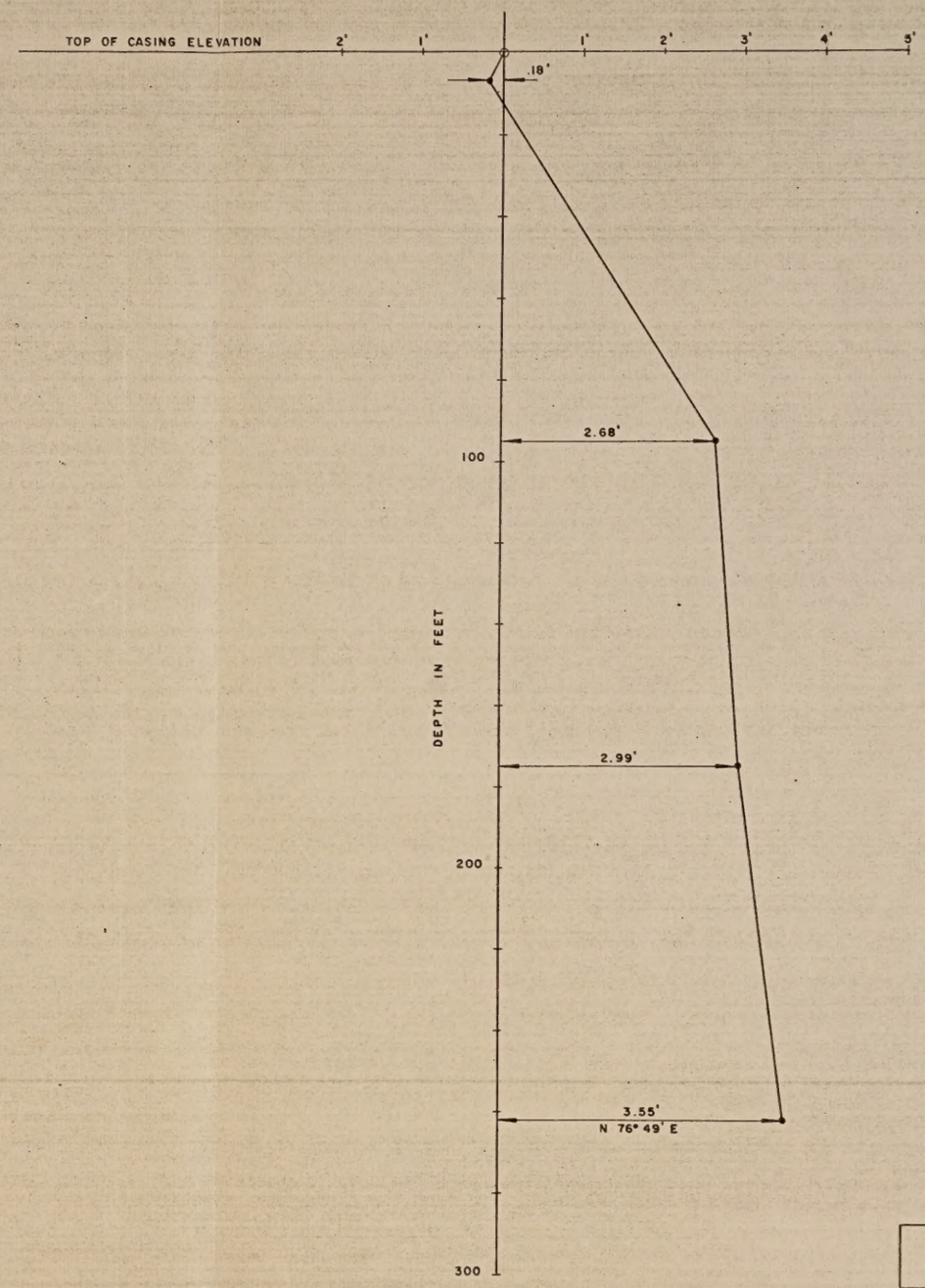
Albany, New York 12232

Fig. 2



PLAN VIEW

SCALE : 1"=2'



VERTICAL PROJECTION

SCALE

HORIZONTAL: 1" = 2'

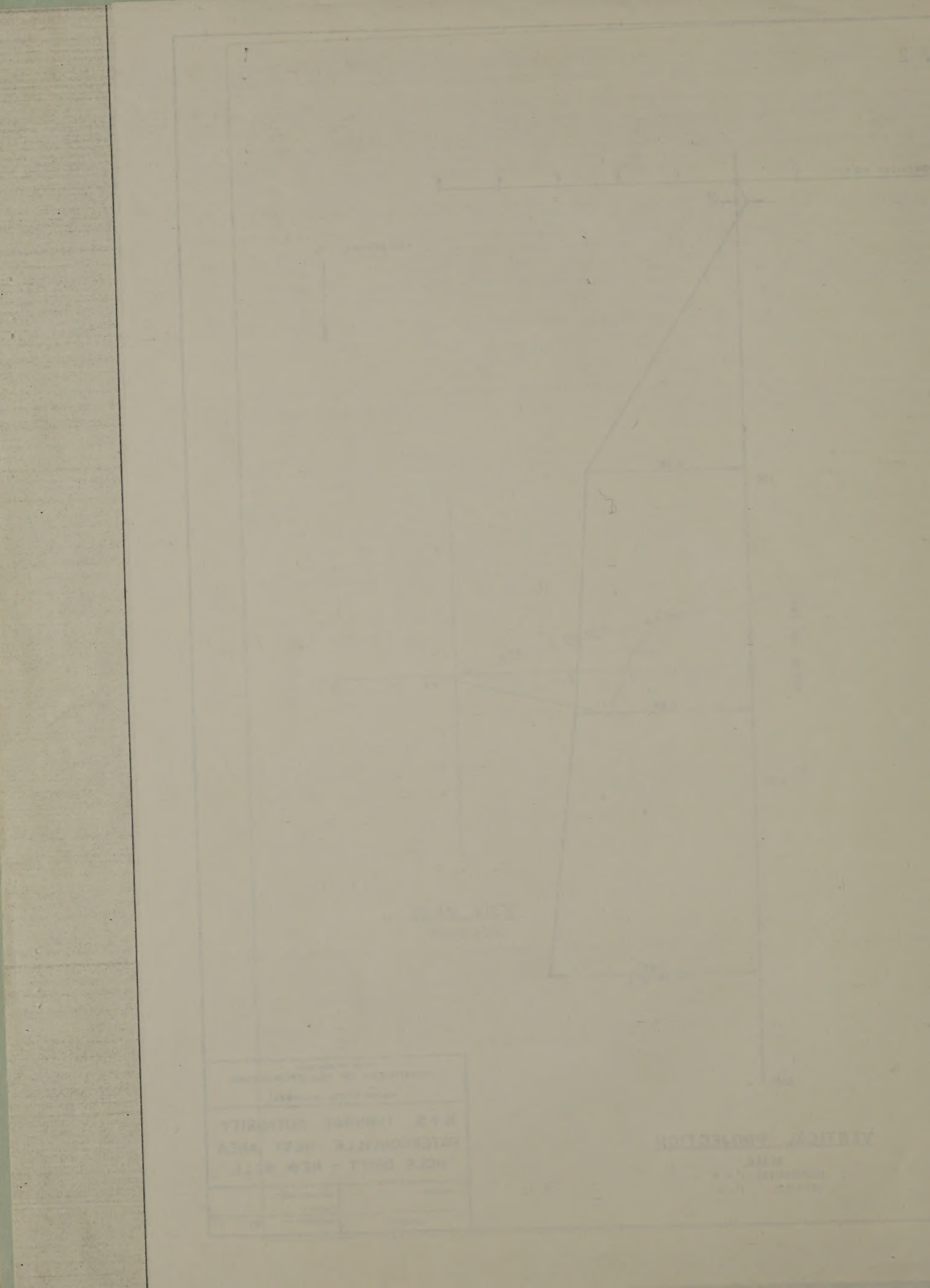
VERTICAL: 1" = 40'

STATE OF NEW YORK
DEPARTMENT OF TRANSPORTATION
BUREAU OF SOIL MECHANICS

N.Y.S. THRUWAY AUTHORITY
PATERSONVILLE REST AREA
HOLE DRIFT - NEW WELL

APPROVED 19
DIRECTOR

DISTRICT NO
COUNTY
DRAWING NO. SM



June 18, 1969

Mr. Belmont M. Williams
Chief Engineer
N.Y.S. Thruway Authority
P.O. Box 189
Albany, New York 12201

PROJECT: Water Well
Pattersonville
Service Area

Dear Mr. Williams:

Herewith is a report, prepared by Francis R. Irving, Senior Engineering Geologist, on the findings of the television borehole camera survey made of the well at the Thruway Authority's Pattersonville Service Center.

Very truly yours,

Wm. P. Hofmann

Wm. P. Hofmann, Director
Bureau of Soil Mechanics

FRI:B
cc: Mr. G. W. McAlpin

June 18, 1959

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REPORT OF TELEVISION BOREHOLE SURVEY
OF A WELL
AT THE PATTERSONVILLE SERVICE AREA
ON THE NEW YORK STATE THRUWAY

By

Francis R. Irving
Senior Engineering Geologist

REPORT OF TELEVISION BORINGS SURVEY

OF A WELL

AT THE BATTERSONVILLE SERVICE AREA

ON THE NEW YORK STATE THRUWAY

By

Francis R. Irving
Senior Engineering Geologist

BOREHOLE TELEVISION SURVEY

Pattersonville Service Area - N.Y.S.T.A.

A borehole television camera survey of the second of two existing wells was conducted by personnel from the Bureau of Soil Mechanics on April 20, 1969, at the Pattersonville Service Area of the New York State Thruway. The survey was conducted at the request of Mr. Belmont Williams, Chief Engineer of the Thruway Authority.

The well surveyed, the newer one of the two wells at this service area, is 490 feet deep. The top of bedrock is approximately four feet below the present top of the eight-inch casing. The casing is set into rock approximately 92 feet. The well log, taken from the log received from the Thruway Authority, is included as Figure 1.

This well has a history of silt in the water, reportedly increasing after heavy rains. Recently an attempt was made to insert a seal below the eight-inch casing. This seal was close to eight inches in diameter and attached to a six-inch pipe. The seal could not be pushed past about 20 feet.

The Borehole Television Camera Survey was made (1) to determine the reason for the hangup of the seal and (2) to determine, if possible, the source of the silt. The T. V. probe was lowered to a depth of 265 feet, with the T. V. Screen and the inclinometer monitored continuously during the lowering and raising of the probe.

The reason for the hangup is evident in the accompanying drawing (Fig. 2). According to Mr. Paul H. Bird of this Bureau, "This well went off plumb soon after it was started." Attempts made to straighten it with wedges on the way down resulted in the corkscrew pattern shown in Fig. 2. The reverse bend at six feet was probably made in an attempt to straighten the casing after it was seated. There are twelve threads of the coupling visible at this joint. The joint is about one foot below the bottom of the 12-inch casing and two and a half feet below the top of rock. The seal on the six-inch pipe passed this bend but eventually hung up because of friction at three points: (1) between the seal and the side of the casing below the bend at six feet, (2) the sides of the six-inch pipe rubbing against the bend, and (3) against the top of the casing opposite the bend.

The source of the silt is a more difficult porblem. The possibilities are:

1. A crack in the casing,
2. seepage around the casing,
3. gouge clay from a fault below the casing, or
4. insoluable residue from solution channels in the rock.

The casing appears intact except for the joint at six feet where approximately one inch of threads are exposed. Leakage here, near the top of rock, would agree with the report of increased silt after heavy rainfalls. Since the seal can be inserted

The cement job [illegible] is [illegible] in the accompanying drawing (Fig. 4). According to Mr. [illegible], [illegible] of this [illegible], "This well went off [illegible] soon after it was cemented." Although [illegible] it [illegible] in the [illegible] pattern in the [illegible] pattern shown in Fig. 2. The [illegible] bend at six feet was probably made in an attempt to straighten the casing after it was cemented. There are twelve threads of the coupling visible at this joint. The joint is about one foot below the bottom of the 12-inch casing and two and a half feet above the top of rock. The seal on the six-inch pipe prevents this joint from [illegible] being [illegible] of [illegible] at three points: (1) between the seal and the side of the casing below the bend at six feet, (2) the sides of the six-inch pipe rubbing against the [illegible], and (3) against the top of the casing opposite the bend.

The source of the silt is a more difficult question. The possibilities are:

1. A crack in the casing,
2. seepage around the casing,
3. [illegible] clay from a [illegible] below the casing, or
4. [illegible] [illegible] from solution channels in the rock.

The casing appears intact except for the joint at six feet [illegible] approximately one inch of [illegible] [illegible] are [illegible]. [illegible] [illegible], near the top of rock, would agree with the report of [illegible] [illegible] after heavy rainfalls. Since the seal can be [illegible]

below this point, a pumping test could be run to determine if this is the source.

The casing appeared to be well seated. The rock below the casing was fractured for a few inches because of the impact of the casing. However, there did not appear to be anything abnormal here.

Major faults cross the Mohawk Valley both east and west of this site. The fault at Hoffman's is quite close. The possibility of minor related faults at the actual site is high. No faulting was noted between the bottom of the casing and the 265 foot level, the maximum depth to which the T. V. probe was lowered. However, two notes on the accompanying driller's log may indicate fault zones. The upper one, "yellow silt" from 88 feet to 101 feet, is cased off. The lower one, "decomposed granite" from 297 feet to 318 feet, may be a crushed zone and a source of the fines. The original well obtained most of its water from the dolomite underlying this zone.

Solution channels may exist almost anywhere in this well. No large ones were visible in the section logged, but they could exist below the 265 foot level.

short of drilling a new well, the recommended procedure from here is —

1. Examine the silt for any possible diagnostic features which may identify its source.

2. If the source cannot be identified:

   a) Set a seal below the joint at the six foot level and run a pump test.

   b) If the silt persists, then straighten the bend at six feet and set the seal below the "decomposed granite" at 320 feet more or less.

Ex. of silt showed
Aragonite
selinite
Doubly. term. Quartz

FIGURE 1

LOG OF WELL

(Data taken from a handwritten record received from the Thruway Authority)

Diameter of well	8"
Depth of well	490'
12-inch casing*	13.5'
8-inch casing	103.8'
Surface to 8'	Soil and gravel
8' to 12'	Silt and gravel
12' to 88'	Fissured limestone with large seams of gravel, silt and clay
88' to 101'	Yellow silt
103' to 164'	Hard limestone
164' to 281'	Limestone
281' to 297'	Sandstone
297' to 318'	Decomposed granite
319' to 490'	Dolomite
Aquifer - Rock	
Static water level	50' below surface
Water yield	1486 GPM at 105'
Draw down pumping time	39 hours

* The upper eight feet of the casing as placed was cut off when the pumphouse was installed.

FIGURE 1

LOG OF WELL

(Data taken from a handwritten record received from the Throney Machinery)

Diameter of well	8"
Depth of well	490'
12-inch casing*	13.5'
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Surface to 8'	Soil and gravel
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88' to 103'	Yellow silt
103' to 164'	Hard limestone
164' to 281'	Limestone
281' to 297'	Sandstone
297' to 319'	Decomposed granite
319' to 490'	Dolomite

Aquifer - Rock

Static water level	30' below surface
Water yield	1456 GPM at 105'
Drew down pumping time	39 hours

* The upper eight feet of the casing as placed was cut off when the pumphouse was installed.

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LRI